

Expert Opinions Regarding Biosolids Useability

In 1981, Del Monte Corporation, along with other food processors, announced that they would no longer accept fruit and vegetables for processing that had been grown on biosolids treated soils. Officials from the U.S. Department of Agriculture (USDA), the Food and Drug Administration (FDA), and EPA met with representatives of the National Food Processors Association to address the food processor's concerns.

After analyzing the available health and safety information pertaining to these practices, the USDA, FDA, and EPA issued guidance and a joint policy statement in 1981 that was signed by the Administrators of each Agency. The Agencies endorsed using biosolids on land for producing fruits and vegetables, and concluded:

"that the use of high quality [biosolids], coupled with proper management procedures, should safeguard the consumer from contaminated crops, minimize any potential adverse effect on the environment," and

"that, with the adherence to the guidance contained in this document, the safety and wholesomeness of the fruit

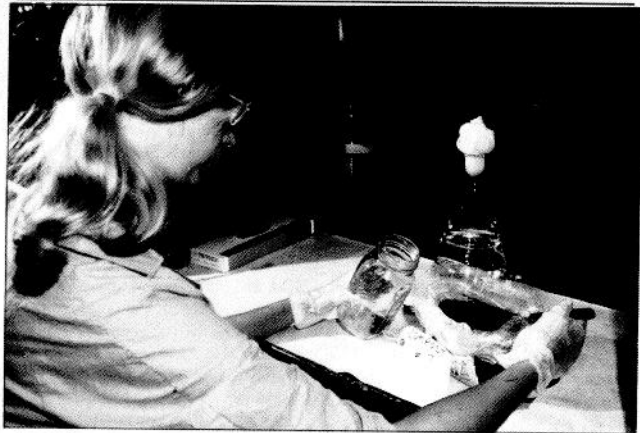
and vegetable crops grown on [biosolids]-amended soils will be assured."

In 1983, over 200 health and environmental experts from the United States, Canada, and Europe met in Denver, CO, to assess the state of the art for biosolids use and disposal (ten years after a similar meeting in Champaign, IL). These experts arrived at a published consensus that the existing guidance and regulations were adequately protective of public health and the environment, provided that biosolids were used in accordance with those provisions. They concluded:

"Guidelines have been developed to enable the environmentally safe use of [biosolids] containing median concentrations of metals and organics when the [biosolids] are applied at agronomic rates based upon nitrogen or phosphorus utilization by crops."

"Groundwater monitoring for nitrate-nitrogen is not needed where [biosolids] nitrogen additions do not exceed fertilizer nitrogen recommendations for the crop grown."

"Using [biosolids] for reclamation of disturbed land



Sampling composted biosolids for pathogen analysis. Studies show that properly composted biosolids are safe for use.

at rates higher than those for agricultural land, when properly implemented and managed, improve the quality of soils, groundwater or vegetation."

"With proper management and safety allowances based on research data, land application is a safe, beneficial and acceptable alternative for treatment of municipal wastewater and [biosolids]."

Some concern has been expressed about the possibility that land-applied biosolids might damage crops, livestock, or the land itself resulting in possible financial loss to the farmer or

his mortgage lender. Some concern has also been expressed about possible future loss that might occur if new discoveries were to show unanticipated hazards from previous biosolids use.

While there can be no guarantees, past experiences with agronomic use of biosolids have been very reassuring. Where biosolids have been applied in accordance with regulations, problems that have occurred are rare and are generally related to inadequate field management and not biosolids quality -- virtually the same type of problems which have occurred from other normal farming practices. All research to date leads to the conclusion that the agronomic use of high quality biosolids is sustainable and very safe.

Overview of the Development of the Rule

Each series of biosolids guidance and regulations, developed by EPA since the mid 1970's, has been based upon the most recent knowledge about the risks and benefits of disposing and using biosolids. Over time, the amount of information and understanding obtained from research and operational experience upon which these efforts were based

has continued to increase. The EPA effort to determine what would be permissible increases in soil and crop pollutant contents as a result of biosolids additions to land has been scientific and conservative and has involved the expert assistance of USDA and other cooperating institutions. This EPA approach contrasts with the policy-based approach taken by some other countries to limit increases of pollutants in soils to some small fraction of "background environmental

Table 2A Most Limiting Pathway for Each Biosolids Pollutant Remaining in the Final Part 503 Rule*

Sludge Pollutant	Highly Exposed Individual	Most Limiting Pathway
Arsenic	Biosolids eaten by child	3
Cadmium	Biosolids eaten by child	3
Chromium	Phytotoxic plant	8
Copper	Phytotoxic plant	8
Lead	Biosolids eaten by child	3
Mercury	Biosolids eaten by child	3
Molybdenum	Animal eating feed	6
Nickel	Phytotoxic plant	8
Selenium	Biosolids eaten by child	3
Zinc	Phytotoxic plant	8

* The regulatory limit for each pollutant was based on the exposure pathway found to be the most limiting for that pollutant.

Table 2B Most Limiting Pathway for Each Biosolids Pollutant
Deleted from the Final Part 503 Rule

Biosolids Pollutant	Highly Exposed Individual	Most Limiting Pathway
Aldrin	Eating animal fat/milk	5
Dieldrin	Eating animal fat/milk	5
Benzo(A)Pyrene	Biosolids eaten by child	3
Chlordane	Biosolids eaten by child	3
DDT/DDD/DDE	Eating fish	12
DimethylNitrosamine	Biosolids eaten by child	3
Heptachlor	Eating animal fat/milk	5
Hexachlorobenzene	Eating animal fat/milk	5
Hexachlorobutadiene	Eating animal fat/milk	5
Lindane	Biosolids eaten by child	3
PCB's	Eating animal fat/milk	5
Toxaphene	Eating animal fat/milk	5
Trichloroethylene	Biosolids eaten by child	3

*** Pollutant deleted because (1) it was not present in NSSS studied biosolids, (2) it was only present in biosolids at levels about 10 to 100 times below the pollutant limits calculated by risk assessment for biosolids to be protective of human health and the environment, or (3) the pollutant has been banned by EPA and is no longer being manufactured or used in the United States.

levels" without careful assessment of positive or negative impact.

As a result of the statutory directive in Section 405 of the Clean Water Act, EPA has expanded its regulatory efforts by developing a new comprehensive risk-based rule for

biosolids. In this expanded effort, which began in 1984, EPA increased the number of pollutants considered to over 50. However, after careful screening and analysis, the Agency reduced this to a list of 25 crucial pollutants (Tables 2A/2B).



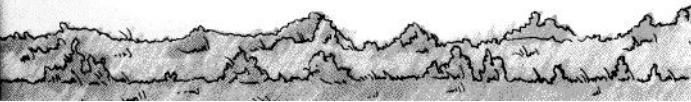
Risk from exposure to these 25 pollutants was evaluated via 14 different public health and environmental pathways (Table 3). The new method, which was established for conducting this multimedia risk assessment, was reviewed and approved by EPA's Science Advisory Board.

Many careful decisions were made during this intensive effort to select data that was more representative, assumptions that were more realistic, and models that were more appropriate. This effort has resulted in a final rule with many of the proposed standards becoming less restrictive and complex than previously believed necessary because of the more comprehensive and appropriate research data base, assumptions, and modeling.

Rule development will continue. Additional pollutants may be added to or deleted from the Part 503 rule, and restrictiveness may change. One example of change in the Part 503 rule was the elimination from the regulation, after initial proposal and subsequent evaluation, of 14 toxic organic pollutants. The basis for elimination is discussed in a later section of this document entitled "Features of the Risk Assessment Process" and are also listed in a footnote to Table 2.

Table 3

PATHWAY	
1	Biosolids-Soil-Plant-Human
2	Biosolids-Soil-Plant-Human
3	Biosolids-Soil-Human
4	Biosolids-Soil-Plant-Animal-Human
5	Biosolids-Soil-Plant-Human
6	Biosolids-Soil-Plant-Animal
7	Biosolids-Soil-Animal
8	Biosolids-Soil-Plant
9	Biosolids-Soil-Soil Biota
10	Biosolids-Soil-Soil Biota-Biota Predator
11	Biosolids-Soil-Airborne Dust-Human
12	Biosolids-Soil-Surface Water/Fish-Humans
13	Biosolids-Soil-Air-Human
14	Biosolids-Soil-Groundwater-Human



DESCRIPTION

- Consumers in regions heavily affected by landspreading of biosolids
- Farmland converted to residential home garden five years after reaching maximum biosolids application
- Farmland converted to residential use five years after reaching maximum biosolids application with children ingesting biosolids-amended soil
- Households producing a major portion of their dietary consumption of animal products on biosolids-amended soil
- Households consuming livestock that ingest biosolids-amended soil while grazing
- Livestock ingesting food or feed crop grown in biosolids-amended soil
- Grazing livestock ingesting biosolids/soil
- Crops grown on biosolids-amended soil
- Soil biota living in biosolids-amended soil
- Animals eating soil biota living in biosolids-amended soil
- Tractor operator exposed to dust from biosolids-amended soil
- Humans eating fish and drinking water from watersheds draining biosolids-amended soils
- Humans breathing fumes from any volatile pollutants in biosolids
- Humans drinking water from wells surrounded by biosolids-amended soils

